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EXAMINER	
ZHU, RICHARD Z	

ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/547,338	ITOYAMA ET AL.	
	Examiner	**Art Unit**	
	RICHARD Z. ZHU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-29_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _01 September 2005_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _09/01/2005_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on applications JP 2003-057548, JP 2003-300511 filed in Japanese Patent Office on 03/04/2003 and 08/25/2003 respectively. Certified copies of said Japanese Applications had been received.
2. Acknowledgment is made of applicant's claim for domestic priority based on PCT/JP04/02590 filed on 03/02/2004.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-17 and 25-26 are rejected under 35 USC 103(a) as being unpatentable over ***Hamamichi et al (US 5539500 A)*** in view of ***Soma et al. (US 4141646 A)***.

Regarding the apparatus of Claim 25 and therefore the method of Claim 1, ***Hamamichi*** discloses an image forming apparatus (**Fig 1 and see Col 3, Rows 64-65, Digital Color Copying Apparatus**) comprising:

a developing unit for containing a two-component developer including toner and carrier (**Fig 1, Developing Devices 45a through 45d and see Col 4, Rows 37-44, a**

selection of CMYK colors is transferred from the photosensitive drum 41 onto a copy sheet wrapped around the transfer drum 51 via the transfer charger 46);

a toner density detecting unit for detecting a toner density in the developing unit (**Fig 10, ADDC Sensor 800 is an image density sensor used to give image density feedback for developing bias and exposure light control, see Col 7, Rows 44-50 or See Fig 15, ATDC sensors 601a-601d for detecting volume density of developing material within developing devices 45a-45d**);

a humidity detecting unit for detecting humidity information around the developing unit (**Fig 4, Humidity Sensor 300, and see Col 5, Rows 1-5**);

an image density correction control unit for forming a reference visible image based on a set value of a predetermined image forming condition, detecting a density of the formed reference visible image, and correcting the set value (**Fig 10, CPU 900 and see Col 5, Rows 50-65 and Col 7, Row 63 – Col 8, Row 23, in coordination with AIDC sensor 800, see Col 7, Rows 45-60, forming a test pattern->detect density->automatically correct changes in image density over time**);

a judging unit for determining whether or not a set value of an image forming condition has been corrected beyond a predetermined range with respect to an initial value (**Fig 10, CPU 900 and see Col 8, Rows 8-18**);

a detecting unit for detecting a humidity change by monitoring an output of the humidity detecting unit, when said unit determines that a correction value with respect to the initial value exceeds the predetermined range (**Col 7, Row 58 – Col 8, Row 4, CPU 900 and**

humidity controller 400 and humidity sensor 300. Col 8, Rows 18-28, controlling humidity to obtain constant image density by monitoring an output of humidity sensor 300 for humidity change, see Col 6, Rows 1-43);

a determining unit for determining a correction value of the toner density reference value, based on the humidity change detected by the detecting unit (**Col 8, Rows 8-18, CPU 900 determines the proper correction value on the basis of sensor outputs**); and

a correcting unit for correcting the toner density reference value using the correction value determined by the determining unit (**Col 7, Rows 44-55, AIDC sensor 800 being used to give image density feedback and automatically correct changes in image density over time**).

Hamamichi does not teach a toner supply unit for supplying toner to the developing unit and a toner supply control unit for controlling the toner supply unit by comparing an output value from the toner density detecting unit with a toner density reference value stored in memory unit.

Soma discloses an image formation apparatus (**Fig 1**) for compensating decreases in developing liquid density or concentration due to precipitation of developing liquid due to prolong down time (**Col 4, Rows 65-67**) comprising:

a sensor for detecting concentration of developing liquid within its developing device (**Col 3, Rows 1-10 and see Col 4, Rows 38-41**);

a toner supply unit for supplying toner to the developing unit (**Col 4, Row 44 – Col 5, Row 2, the unshown supply device to supply toner to the developer, Col 4, Rows 60-61**);

a toner supply control unit for controlling the toner supply unit by comparing an output value from the toner density detecting unit with a toner density reference value stored in memory unit (**Col 4, Row 44 – Col 5, Row 2, a first concentration detecting circuit Q1 for supplying toners to the developing device and a second concentration detecting circuit Q2 for stirring the liquid within the developing device**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to first modify the ADTC sensor of ***Hamamichi*** with the functions of Q1 and Q2 of ***Soma*** and to further modify the CPU driven controllers of ***Hamamichi*** with additional subroutines to perform the logical functions of determining whether or not to supply the developing device with additional toner of ***Soma*** on the basis of the voltage level of the developing liquid detected by the modified ADTC sensor whereas the motivation would've been to provide an image formation apparatus of the liquid development type in which, even after a long downtime, a sufficient wait time is secured to ensure good image formation during the next cycle of the electrophotographic process (***Soma*, Col 1, Rows 56-62**).

Regarding Claim 2, *Hamamichi* discloses wherein

the determination step is a first determination step for determining whether or not a correction value with respect to the initial value of the set value of the image forming condition is equal to or larger than a comparative reference value (**Col 8, Row 65 – Col 9,**

Row 2, determining if change in residual voltage is greater than 50), and further comprises

a second determination step for determining that the correction value is negative when a determination is made in the first determination step that the correction value is not equal to or larger than the comparative reference value, and determining whether or not an absolute value of the correction value is equal to or larger than the comparative reference value (**Col 8, Row 65 – Col 9, Row 2, bringing the humidity to stable state by activating dehumidifier until the change in resident voltage is less than 50**), and

the humidity detection step is a step of detecting humidity when a determination is made in the first determination step or the second determination step that the absolute value of the correction value is equal to or larger than the comparative reference value (**Fig 14, since the process is gradual and over multiple iterations of data sampling, humidity detection by sensors are performed iteratively**).

Regarding Claim 3, ***Hamamichi*** discloses wherein the comparative reference value differs depending on whether the correction value of the set value of the image forming condition is positive or negative (**Col 8, Row 65 – Col 9, Row 2**).

Regarding Claim 4, ***Hamamichi*** discloses a humidity change determination step for determining whether or not the humidity detected in the humidity detection step has changed and become lower by an amount equal to or larger than a predetermined value from the humidity when the toner density reference value was corrected previously, when a determination is made in the first determination step that the correction value is equal to or

larger than the comparative reference value (**Col 8, Row 65 – Col 9, Row 2, determining change in residual potential, then determining if the change in residual potential is greater 50. If it is, image density is determined to be high due to high humidity. If it is not, image density is determined to be low due to low humidity. See Fig 14**),

wherein when a determination is made in the humidity change determination step that the humidity has changed and become lower by an amount equal to or larger than the predetermined value, a correction value of the toner density reference value is determined based on the changed value to increase a supply amount of toner by the correction value determination step (**Col 8, Row 65 – Col 9, Row 2 in view of Fig 8 and Col 4, Rows 55-64, and Col 10, Rows 15-20. When humidity is high, change in residual potential becomes unstable and large and image density increases undesirably. The converse is true in view of Fig 8 when humidity is too low and image density decreases. Therefore, AIDC 800 in coordination with humidity controller 400 and CPU 900 automatically correct changes in image density over time including increasing image density when humidity is below 40% RH and decreasing image density when humidity is above 60% RH, see Col 6, Rows 35-42 and Col 7, Rows 44-50**).

Regarding Claim 5, *Hamamichi* discloses a humidity change determination step for determining whether or not the humidity detected in the humidity detection step has changed and become lower by an amount equal to or larger than a predetermined value from the humidity when the toner density reference value was corrected previously, when a determination is made in the first determination step that the correction value is equal to or larger than the comparative reference value (**Col 8, Row 65 – Col 9, Row 2, determining**

change in residual potential, then determining if the change in residual potential is greater 50. If it is, image density is determined to be high due to high humidity. If it is not, image density is determined to be low due to low humidity. See Fig 14); and

a step of determining a correction value of the toner density reference value to increase a supply amount of toner, when a determination is made in the humidity change determination step that the humidity change is a change within the predetermined value (**Col 8, Row 65 – Col 9, Row 2 in view of Fig 8 and Col 4, Rows 55-64, and Col 10, Rows 15-20. When humidity is high, change in residual potential becomes unstable and large and image density increases undesirably. The converse is true in view of Fig 8 when humidity is too low and image density decreases. Therefore, AIDC 800 in coordination with humidity controller 400 and CPU 900 automatically correct changes in image density over time including increasing image density when humidity is below 40% RH and decreasing image density when humidity is above 60% RH, see Col 6, Rows 35-42 and Col 7, Rows 44-50**).

Regarding Claim 6, *Hamamichi* discloses wherein said step is a step of determining the correction value by a correction value of the image forming condition (**Col 7, Rows 44-50, correction of image forming density or Col 6, Rows 35-42, correcting humidity conditions and see Col 8, Rows 8-18**).

Regarding Claim 7, *Hamamichi* discloses a humidity change determination step for determining whether or not the humidity detected in the humidity detection step has changed and become higher by an amount equal to or larger than a predetermined value from the

humidity when the toner density reference value was corrected previously, when a determination is made in the second determination step that the correction value of the image forming condition is negative and the absolute value of the correction value is equal to or larger than the comparative reference value (**Col 8, Row 65 – Col 9, Row 2, determining change in residual potential, then determining if the change in residual potential is greater 50. If it is, image density is determined to be high due to high humidity. If it is not, image density is determined to be low due to low humidity. See Fig 14**),

wherein when a determination is made in the humidity change determination step that the humidity has changed and become higher by an amount equal to or larger than the predetermined value, a correction value of the toner density reference value is determined based on the changed value to decrease a supply amount of toner (**Col 8, Row 65 – Col 9, Row 2 in view of Fig 8 and Col 4, Rows 55-64, and Col 10, Rows 15-20. When humidity is high, change in residual potential becomes unstable and large and image density increases undesirably. The converse is true in view of Fig 8 when humidity is too low and image density decreases. Therefore, AIDC 800 in coordination with humidity controller 400 and CPU 900 automatically correct changes in image density over time including increasing image density when humidity is below 40% RH and decreasing image density when humidity is above 60% RH, see Col 6, Rows 35-42 and Col 7, Rows 44-50**).

Regarding Claim 8, *Hamamichi* discloses a humidity change determination step for determining whether or not the humidity detected in the humidity detection step has changed and become higher by an amount equal to or larger than a predetermined value from the

humidity when the toner density reference value was corrected previously, when a determination is made in the second determination step that the correction value of the image forming condition is negative and the absolute value of the correction value is equal to or larger than the comparative reference value (**Col 8, Row 65 – Col 9, Row 2, determining change in residual potential, then determining if the change in residual potential is greater 50. If it is, image density is determined to be high due to high humidity. If it is not, image density is determined to be low due to low humidity. See Fig 14**); and

a correction value determination step for determining a correction value of the toner density reference value to decrease a supply amount of toner, when a determination is made in the humidity change determination step that the humidity change is a change within the predetermined value (**Col 8, Row 65 – Col 9, Row 2 in view of Fig 8 and Col 4, Rows 55-64, and Col 10, Rows 15-20. When humidity is high, change in residual potential becomes unstable and large and image density increases undesirably. The converse is true in view of Fig 8 when humidity is too low and image density decreases. Therefore, AIDC 800 in coordination with humidity controller 400 and CPU 900 automatically correct changes in image density over time including increasing image density when humidity is below 40% RH and decreasing image density when humidity is above 60% RH, see Col 6, Rows 35-42 and Col 7, Rows 44-50**).

Regarding Claim 9, *Hamamichi* discloses wherein said step is a step of determining the correction value by a correction value of the image forming condition (**Col 7, Rows 44-50, correction of image forming density or Col 6, Rows 35-42, correcting humidity conditions and see Col 8, Rows 8-18**).

Regarding Claim 10, ***Soma*** discloses wherein when making a correction to decrease the supply amount of toner, the correction is performed at one time (**Col 4, Row 61 – Col 5, Row 2, Rows 20-25, and Rows 52-60, stirring the liquid until developing liquid concentration meets the second detection circuit Q2's detection level or threshold. That is, the supply amount of toner is instantly decreased to zero when it is found that the concentration of the developer liquid meets the first detection circuit Q1's detection level or threshold**).

Regarding Claim 11, ***Soma*** discloses wherein when making a correction to increase the supply amount of toner, the correction is made gradually (**Col 4, Rows 60-61, Col 6, Rows 30-33 and Rows 40-48, a predetermined amount of time is needed to supply the toner to the developing device until its concentration meets requirement**).

Regarding Claim 12, ***Soma*** discloses a step of determining whether or not a detection value outputted by the toner density detecting unit has reached the toner density reference value after correction, when the toner density reference value is corrected (**Col 4, Row 44 – Col 5, Row 2, determining if the concentration level of the developing liquid meets the first detection circuit Q1's detection level; if it does not, supply additional amount of toner to provide a correction value for adjusting developing liquid concentration; if it does, thereafter determining if the concentration level of the developing liquid meets the second detection circuit Q2's detection level**),

wherein when a determination is made in said step that the detection value has reached the toner density reference value after correction, the correction of the toner density

reference value is executed (**Col 5, Rows 20-25, 52-60, Col 6, Rows 8-18, and Rows 40-48. The process of determinations and corrections noted above are executed until concentration of developing liquid meets requirement**).

Regarding Claim 13, ***Soma*** discloses a step of determining whether or not a detection value outputted by the toner density detecting unit has reached the toner density reference value after correction, when the toner density reference value is corrected (**Col 4, Row 44 – Col 5, Row 2, determining if the concentration level of the developing liquid meets the first detection circuit Q1's detection level; if it does not, supply additional amount of toner to provide a correction value for adjusting developing liquid concentration; if it does, thereafter determining if the concentration level of the developing liquid meets the second detection circuit Q2's detection level**),

wherein when a determination is made in said step that the detection value has reached the toner density reference value after correction, the correction of the set value of the image forming condition is executed (**Col 5, Rows 20-25, 52-60, Col 6, Rows 8-18, and Rows 40-48. The process of determinations and corrections noted above are executed until concentration of developing liquid meets requirement**).

Regarding Claim 14, ***Soma*** discloses a step of storing a developer agitation time since an initial time of the developer contained in the developing unit and a step of correcting the toner density reference value using a correction value corresponding to the developer agitation time stored in said step (**Col 5, Rows 3-25, a predetermined wait time is**

implemented by the circuit to prevent image processing until the develop reaches proper concentration; that is, until the correction process is completed).

Regarding Claim 15, *Hamamichi* discloses wherein the correction of the image forming condition is one or a plurality of corrections on a development bias voltage value applied to develop an electrostatic latent image (**Col 7, Rows 44-50, developing bias and exposure light control**), a charging voltage value for charging a photoreceptor (**Fig 7, and see Col 6, Row 54 – Col 7, Row 3**), a transfer voltage value for transferring the developing image to a transfer material (**Col 8, Rows 8-18**), and an exposure amount for exposing the photoreceptor (**Col 7, Rows 44-50, developing bias and exposure light control**).

Regarding Claim 16, *Soma* discloses a step of measuring an elapsed time since forming an image (**Col 3, Rows 37-40, determining the time during which the apparatus has been left inoperative**);

a step of determining whether or not the measured elapsed time exceeds a predetermined time (**Col 3, Rows 50-55, the wait time or agitation time is dependent upon how long the image processing apparatus has been left inoperative, or since the last time it has formed an image**); and

a step of determining a correction value of the toner density reference value based on the elapsed time, regardless of an output value from the toner density detecting unit, when a determination is made in the determination step that the elapsed time exceeds the predetermined time (**Col 3, Rows 37-54, determining a wait time so as to perform the

process of bringing developer liquid concentration up to standard by determining a correction value for adjusting liquid concentration).

Regarding Claim 17, ***Soma*** discloses a step of measuring an elapsed time since forming an image (**Col 3, Rows 37-40**); and

a step of determining a correction value of the toner density reference value, based on a previous output value from the toner density detecting unit and the elapsed time (**Col 3, Rows 37-54 and see Col 4, Row 44- Col 5, Row 2**).

Regarding Claim 26, ***Hamamichi*** discloses a developing device for containing developers of a plurality of colors (**Col 4, Rows 37-44, developing device for CMYK color printing**).

5. Claims 18-22 are rejected under 35 USC 103(a) as being unpatentable over the combined teachings of ***Hamamichi et al (US 5539500 A)*** and ***Soma et al. (US 4141646 A)*** in view of ***Asanuma et al. (US 5216470 A)***.

Regarding Claim 18, the combined teachings do not teach a step of measuring a continuous supply time in which the toner is continuously supplied since the start of toner supply

Asanuma teaches a method for determining conditions when a toner density within a developer unit is low and upon meeting said conditions, toners are supplied to the developer unit (**Col 3, Rows 5-25, developing unit, and see Col 3, Rows 50-55, supplying toners to adjust toner density**) wherein:

a step of measuring a continuous supply time in which the toner is continuously supplied since the start of toner supply (**Col 4, Rows 1-20, in order to know the precise moment to measure density of toner at predetermined intervals, it is necessary to measure a continuous supply time in which the toner is continuously supplied**);

a step of determining whether or not the measured continuous supply time exceeds a predetermined time (**Col 4, Rows 1-20, the regular interval at which toner density is measured is a time value threshold that when exceeded, measurement of toner density is taken**); and

when a determination is made in the determination step that the continuous supply time exceeds the predetermined time, measurement of the toner density within the developing unit is performed (**Col 4, Rows 1-20**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the combined teachings to adjust the toner density of its developing unit in the manner of ***Asanuma*** employing the density sensor (**The Volume Density Sensor of *Hamamichi* or the sensor of *Soma***) to measure toner density at predetermined intervals whereas the motivation would've been to provide a method of determining the density of toner with high accuracy (***Asanuma,* Col 2, Rows 40-43**) and to continuously supply a developing unit with sufficient amount and properly concentrated toner (***Asanuma*, Col 3, Rows 50-55**).

The combined teachings as modified by ***Asanuma*** would've yielded a step of restricting forming an image, when a determination is made in the determination step that the

continuous supply time exceeds the predetermined time (***Soma*, Col 5, Rows 22-25, even when copying button is pressed, image forming will not be executed until the developing unit reaches a proper toner density**).

Regarding Claim 19, *Asanuma* discloses a step of measuring an accumulated elapsed time required for an image forming process after supplying the toner (**Col 5, Rows 8-12, a prescribed amount of time required for transition from a first toner sampling process to a second toner sampling process to periodically measure the toner density within the developing unit**);

a step of determining whether or not the measured accumulated elapsed time exceeds a predetermined time (**Col 5, Rows 8-12, the second toner sampling process is started when the prescribed amount of time expires**); and

a step of starting to supply a predetermined amount of toner by the toner supply unit, regardless of an output value from the toner density detecting unit, when a determination is made in the determination step that the accumulated elapsed time exceeds the predetermined time (**Col 5, Rows 8-12, in the next sampling process, if it is determined that toner density is still low, more toner are supplied to the developer unit, Col 3, Rows 50-55**).

Regarding Claim 20, *Asanuma* discloses a step of returning the accumulated elapsed time to an initial value without supplying toner, when the output value of the toner density detecting unit is smaller than the toner density reference value determined in the correction value determination step by a predetermined amount (**Col 4, Rows 1-21 and see Col 5, Rows 1-17, when it is determined that toner concentration is high, no additional toner is**

supplied and stirring member is activated to dilute toner density. The accumulated elapsed time is reset to zero in preparation for the next period of prescribed time period before the next sampling cycle).

Regarding Claim 21, ***Asanuma*** discloses a step of returning the accumulated elapsed time to an initial value when the correction value of the toner density reference value determined in the correction value determination step is positive (**Col 4, Rows 1-21 and see Col 5, Rows 1-17, as noted in the preceding claim**).

Regarding Claim 22, ***Asanuma*** discloses a step of interrupting the measurement of the accumulated elapsed time until the toner density detected by the toner density detecting unit reaches the toner density reference value after correction, after supplying toner by the toner supply unit based on the toner density reference value after correction, when the correction value of the toner density reference value determined in the correction value determination step is positive (**Col 4, Rows 1-21 and see Col 5, Rows 1-17, the sampling cycle remains uninterrupted until it is determined that the toner density within the developing unit has meet satisfactory standard, see Col 5, Rows 18-30 and Col 3, Rows 57-69, density sensor 8 for developer tank 1**).

6. Claims 23-24 are rejected under 35 USC 103(a) as being unpatentable over the combined teachings of ***Hamamichi et al (US 5539500 A)*** and ***Soma et al. (US 4141646 A)*** in view of ***Applicant's Admitted Prior Art*** or ***AAPA***.

Regarding Claim 23, the combined teachings do not disclose wherein an average particle diameter of toner is within a range of 4 to 7 um.

AAPA discloses wherein an average particle diameter of toner is within a range of 4 to 7 um (**Page 5, line 7, average particle diameter of 8um or less**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to have an average particle size of less than 8um in order to decrease the particle diameter of toner and for achieving high image quality as suggested by ***AAPA***.

Regarding Claim 24, the combined teachings do not disclose wherein a content of pigment in toner is within a range of 8 to 20%.

AAPA discloses wherein a content of pigment in toner is within a range of 8 to 20% (**Page 5, lines 4-13**).

It would've been obvious to one of ordinary skill in the art at the time of the invention was made to increase the density of pigment in the toner from between 5% to 6% to 8% to 20% in order to reduce the toner consumption per copy as suggested by ***AAPA***.

7. Claim 27 is rejected under 35 USC 103(a) as being unpatentable over the combined teachings of ***Hamamichi et al (US 5539500 A)*** and ***Soma et al. (US 4141646 A)*** in view of ***Fukuchi et al (US 5126789 A)***.

Regarding Claim 27, ***Soma*** discloses a toner container unit (**Col 3, Rows 1-19, developing device 11**) for storing toner to be supplied by the toner supply unit, wherein the toner container unit includes a recording unit for recording information about use status (**Fig 2-1 and 2-2, see also Col 3, Rows 10-17 and Rows 50-55, determination of time since last operation using recorded information with respect to use status**).

The combined teachings do not disclose that the toner container unit is detachable.

Fukuchi discloses an image processing apparatus having a datable toner container (**Fig 31, Col 35, Rows 11-18, cartridge changing stations**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the combined teachings to have a detachable container unit in order to ensure ease of changing a toner depleted developer unit for a new developer unit.

8. Claim 28-29 are rejected under 35 USC 103(a) as being unpatentable over the combined teachings of ***Hamamichi et al (US 5539500 A)*** and ***Soma et al. (US 4141646 A)*** in view of ***Fukuchi et al (US 5126789 A)*** and ***Asanuma et al. (US 5216470 A)***.

Regarding Claim 28, the combined teachings do not teach a measuring unit for measuring an accumulated time required for supply by the toner supply unit.

Asanuma discloses a measuring unit for measuring an accumulated time required for supply by the toner supply unit (**Col 5, Rows 8-12, timer**), and wherein the recording unit of the toner container unit records the use status based on the measured accumulated (**Col 4, Rows 1-10, in order for the hardware or software to implement the sampling process between prescribed interval of time, information with respect to the measurement performed by the timer must be stored**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of the combined teachings to adjust the toner density of its developing unit in the manner of ***Asanuma*** employing the density sensor (**The Volume**

Density Sensor of *Hamamichi* or the sensor of *Soma*) to measure toner density at predetermined intervals whereas the motivation would've been to provide a method of determining the density of toner with high accuracy (***Asanuma,* Col 2, Rows 40-43**) and to continuously supply a developing unit with sufficient amount and properly concentrated toner (***Asanuma***, **Col 3, Rows 50-55**).

Regarding Claim 29, *Soma* discloses a recording unit for reading the information about the use status recorded in the recording unit of the toner container unit (**Fig 2-2(a), circuit for wait time control, Col 5, Rows 3-25 and see also Col 3, Rows 10-17, in accordance to the relationship between wait time and apparatus inoperative time**); and

a changing unit for changing a preset operating condition when the read information about the use status is information indicating an unused status (**Col 5, Rows 3-25, prohibiting copying from executed when it is determined that the apparatus was in a prolong period of being unused**).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5164771 A, US 5644351 A, US 5826136 A, US 6047147 A, US 6058275 A, US 6064837 A, and US 6249299 B1 discloses method and apparatus for adjusting image output density on the basis a plurality of image forming conditions such as temperature, humidity, interval between operations, and etc.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 7:30 - 4:00.

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